ABEZGAUZ, N.N.; ANISOVA, A.A.; GORBUNOVA, V.I.; ZHMEYDO, A.T.; LEONTOVICH, V.A.

Effect of C-vitaminization of donors on the preservation of the phagocytic reaction and the vitamin C level in leucocytes stored under refrigeration. Probl. gemat. i perel. krovi 10 no.1:45-47 Ja '65. (MIRA 19:1)

1. Laboratoriya konservirovaniya krovi (zav. - prof. F.R. Vinograd-Finkel') TSentral'nogo instituta gematologii i perelivaniya krovi Ministerstva zdravookhraneniya SSSR i vitaminnaya laboratoriya (zav. - prof. S.N. Matsko) Instituta vitaminologii, Moskva.

ANISOVICH, A.I., inzh.; SHADURSKIY, P.A., kand.tekhn.nauk

Working a peat deposit by the excavator method without leaving strips between the sections. Torf. prom. 35 no.3:30-31 '58.
(MIRA 11:5)

1. Belorusskiy gosudarstvennyy institut po proyektirovaniyu zavodov torfyanoy promyshlennosti (for Anisovich). 2. Institut torfa AN BSSR (for Shadurskiy).
(Peat)

ANISOVICH, G.A.; GRINKEVICH, R.N.

Hardening of metal in a nonsymmetrical mold. Dokl. AN BSSR 3 no.8: 345-349 Ag '59. (MIRA 12:11)

1. Predstavleno akademikom AN BSSR K.V. Gorevym.
(Founding)

A[illegible]KOVICH, G. A.

"Control Over the Hardening Process of a Complex Casting"

report presented at the 7th Conference on the Interaction of the Casting Mould and the Casting, sponsored by the Inst. of Mechanical Engineering, Acad. Sci. USSR, 25-28 January 1961.

ANISOVICH, G.A.

Experimental investigation of the temperature field of castings solidifying in molds. Sbor.nauch.trud.Fiz.-tekh.inst.AN BSSR no.6:172-177 '60. (MIRA 14:6)
(Molding (Founding)) (Solidification)

ANISOVICH, G.A.; GRINKEVICH, R.N.; KRAVCHENKO, Ye.V.

Determining thermophysical coefficients for nonmetallic materials. Sbor.nauch.trud.Fiz.-tekh.inst.AN BSSR no.6:183-192 '60. (MIRA 14:6)

(Nonmetallic materials--Thermal properties)

S/123/62/000/013/018/021
A004/A101

AUTHORS: Anisovich, G. A., Grinkevich, R. N., Kravchenko, Ye. V.

TITLE: Determining the thermophysical coefficients of nonmetallic materials

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 13, 1962, 4, abstract 13G21 ("Sb. nauchn. tr. Fiz.-tekhn. in-t AS BSSR", 1960, no. 6, 183-192)

TEXT: The thermal properties of the mold considerably affect the forming process of the casting. Thus, e.g. it is possible to change by several times the metal freezing rate and, consequently, affect the properties of the casting, by adding wood sawdust or cast-iron filings to the molding mixture. The thermal properties of the mold do not only depend on the composition, but also on the temperature of the metal to be cast. In connection with this problem, a theory has been developed and a method tested to determine the thermophysical properties of materials in the non-study state at different temperatures. In the test, the thermophysical coefficients are determined by pouring metal at the crystallization temperature into the mold being tested. According to the test data, the thermophysical coefficients of molding mixtures can mainly be calculated with the aid

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of two methods - the graphic analytical and analytical methods. In determining the thermophysical properties of materials by the graphic analytical method it is necessary to carry out a graphical differentiation and integration of the experimental curve describing the temperature distribution in the mold. This method is very cumbersome, labor-consuming and of insufficient accuracy. To determine the thermophysical properties of materials by the analytical method, it is necesarry to know the function $t = f(x, \tau)$, describing the temperature field of the mold. This function can be presented in an approximate form. In this case the truth of the results obtained will depend on the degree of accuracy with which the assumed function describes the actual temperature field of the mold. The authors suggest an approximate method to determine the coefficients with the aid of a parabola of the nth order or of an exponential curve, developed further from the methods by A. I. Veynik, O. Yu. Kotsyubinskiy and A. S. Khinchin. Both methods are based on the classical solution of the problem on the temperature field of a semi-limited body at boundary conditions of the first kind.

[Abstracter's note: Complete translation]

VEYNIK, A.I., doktor tekhn. nauk, prof.; ANISOVICH, G.A., kand. tekhn. nauk

"Power engineering" by B.I. Bakhmachevskii and others. Reviewed by A.I. Veinik and G.A. Anisovich. Izv. vys. ucheb. zav.; energ. 7 no.11:125-126 N '64 (MIRA 18:1)

1. Fiziko-tekhnicheskiy institut AN BSSR. 2. Chlen-korrespondent AN BSSR (for Veynik).

L 11897-66 EWT(m)/T/EWA(m)-2
ACC NR: AP6000744 SOURCE CODE: UR/0386/65/002/009/0439/0442

44 55

AUTHOR: Anisovich, V. V.

ORG: none

14,55,44

TITLE: Simple high-energy scattering model

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 9, 1965, 439-442

TOPIC TAGS: scattering cross section, strong nuclear interaction, elastic scattering

ABSTRACT: In view of recent attempts to consider high-energy scattering in the framework of SU(6) or SU(3) symmetry together with some additional assumptions concerning the character of the interaction process, the author considers a model in which elastic forward scattering is only via single quark-antiquark scattering. This model is similar to the model of Ye. M. Levin and L. L. Frankfurt (Pis'ma ZhETF v. 2, 105, 1965), but it is assumed here that the only essential quark interactions are those leading to bound states (mesons and baryons), and the remaining interactions are small. It is further assumed that SU(6) symmetry obtains. Under these assumptions, the meson-baryon forward-scattering amplitudes are expressed in terms of two SU(6)-invariant quark-antiquark scattering amplitudes (synplet and 35-plet) and in terms of two three-quark scattering amplitudes (56-plet and 70-plet). This leads to the same relations between the cross sections as obtained earlier by K. Johnson and S. B. Treiman (Phys. Rev. Lett. v. 14, 189, 1965) and by Levin and Frankfurt. In this model

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L 12046-66 EWT(m)/T/EWA(m)-2
ACC NR: AP6002660 SOURCE CODE: UR/0386/65/002/012/0554/0557
44 55 26

AUTHOR: Anisovich, V. V. 44 55

ORG: Institute of High-Energy Physics (Institut fiziki vysokikh energiy)

TITLE: Prediction of masses in mesonic multiplets in the simple quark model

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 12, 1965, 554-557

TOPIC TAGS: elementary particle, strong nuclear interaction, baryon, meson, parity principle

ABSTRACT: This is a continuation of an earlier paper by the author (with Ya. I. Azimov et al., ZhETF Pis'ma v. 2, 109, 1965), which discussed, within the framework of SU(6) symmetry, a model of higher meson resonances, consisting of a quark and antiquark in a state with orbital angular momentum L = 1. It is shown in the present paper that recent experimental data on several meson resonances fit the foregoing model well. The experimental data presented are taken from the proceedings of the Oxford conference (September 1965) and from the reviews by A. H. Rosenfeld et al. (UCRL-8030, 1965) and by S. Goldhaber (UCRL-16295, 1965). It is shown in particular that the mass splitting can describe qualitatively the heavier third quark in some nonets and in the baryon resonances. This circumstance, and also the

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L 12046-66

ACC NR: AP6002660

successful prediction in the simple quark model of quantum numbers and masses of certain resonances signify either that the mass splittings inside the multiplets are actually described qualitatively with the aid of a heavier third quark, or else that there exists a higher symmetry that unifies all the resonances (including baryonic ones). For example, the recently discovered resonance M_1 in the K^+K^+ spectrum, with mass 1280 Mev ($S = 2$, $T = 1$, $J^P = 0^+, 2^+$) offers a good possibility of checking whether the splitting in multiplets with a large number of quarks and antiquarks can be qualitatively described by the heavier third quark. Although some resonances necessary to confirm the proposed model have not yet been observed, the experimental accuracy is insufficient to conclude that they do not exist. If the predicted resonances are observed, this will serve as a serious argument in favor of the simple model. Their absence will indicate the need for searching for a broader symmetry that unifies all the resonances with identical splittings.

SUB CODE: 20/ SUBM DATE: 03Nov65/ ORIG REF: 001/ OTH REF: 005

OC

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L 11969-66 EWT(m) DIAAP

ACC NR: AP6001164 SOURCE CODE: UR/0367/65/002/003/0562/0564

AUTHOR: Anisovich, V.V.; Fomin, V.V.

ORG: Physicotechnical Institute im. A. F. Ioffe, Academy of Sciences SSSR (Fiziko-tekhnicheskiy institut Akademii nauk SSSR)

TITLE: Effect of singularities of triangular diagrams with decay masses on mass spectra of the systems $\pi+\Delta_{1238}$, $\pi+\Sigma_{1385}$ and $\pi+\phi$.

SOURCE: Yadernaya fizika, v. 2, no. 3, 1965, 562-564

TOPIC TAGS: pi meson, meson interaction, proton

ABSTRACT: The influence of logarithmic singularities arising in the triangular diagrams shown in Fig. 1 on the corss sections of the reactions $\pi^-+p\to\pi+\Delta_{1238}$ and $K+p\to\pi+\Sigma_{1385}$ and on the mass spectrum of the system $\pi+\phi$ was studied. It is shown that these diagrams can lead to anomalies in the cross sections (or in mass spectra) amounting to as much as 10 to 20% of the background at $M_{\pi\Delta_{1238}}=2.38$ GeV, $M_{\pi\Sigma_{1385}}'=2.62$ GeV, and $M_{\pi\phi}=1.4$ GeV. The appreciable magnitude of these anomalies permits their experimental observation at the present time. Authors are grateful to N. B. Brovtsyna for

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L 11969-66

ACC NR: AP6001164

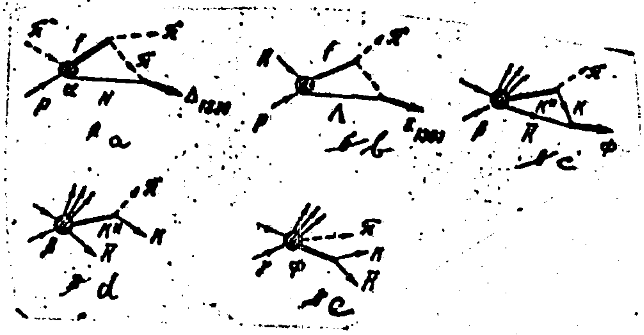

Fig. 1. Triangular diagram of reaction process.

assistance in performing the numerical calculations. Orig. art. has: 3 figures.

SUB CODE: 20 / SUBM DATE: 09Mar65 / OTH REF: 007

HW

Card 2/2

AUTHORS: Anisovich, V. V., Ansel'm. A. A. 56-34-4-32/60

TITLE: The Non-Conservation of Parity in the Processes of the Capture of a Neutrino by Protons and Deuterons (Nesokhraneniye chetnosti v protsessakh zakhvata neytrino protonami i deytronami)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 4, pp. 995-997 (USSR)

ABSTRACT: This paper gives formulas for the cross sections of the induced β-decay of the protons ($p + \nu \rightarrow n + e^+$) and of the deuterons ($d + \bar{\nu} \rightarrow 2n + e^+$), taking into account the polarization of the impinging antineutrinos. In this connection also the target--nuclei are presumed to be polarized. First of all an expression for the density matrix of a polarized particle-beam with the spin 1/2 and the mass 0, is written down. In the tests dealing with the induced β-decay, neutrinos which are emitted from a reactor are used. Under these conditions a polarization of the neutrino other than the longitudinal one is difficult. The computations carried out in the usual way lead to quite an extensive expression for the cross section of the capture of an antineutrino by protons. The expression is given in this

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paper. Let the Hamiltonian of the interaction be assumed to have the same form as with T.D. Lee and C.N. Yang (Ref 2). At the capture of a neutrino by polarized protons it is possible to determine whether parity with respect to time is conserved in this process. By measuring the total number of electrons, flying right and left of the plane $\vec{q}, \vec{\zeta}$, the expression $\sigma_+ - \sigma_- = (\alpha_7/4\pi)p^2 \zeta \sin\vartheta$ is obtained for the difference of the cross sections. $\vec{q}$ denotes the momentum of the impinging anti-neutrinos, ζ - the polarization vector of the protons and ϑ - the angle between $\vec{q}$ and $\vec{\zeta}$. If parity with respect to time is maintained, it is true that $\sigma_+ = \sigma_-$. The main consideration of the authors is in this case the fact that the neutrons are produced mainly in the S-state at the reaction $d + \bar{\nu} \rightarrow 2n + e^+$ and that $(\vec{p} - \vec{q})^2/4M\varepsilon_0 \ll 1$ is true. $\vec{p} - \vec{q}$ denotes the total momentum and ε_0 - the binding energy of the deuteron. The expression resulting under those circumstances for the cross section $d\sigma$ is written down and the significance of the terms occurring therein is briefly explained. In conclusion the authors thank I.M. Shmushkevich and V.N. Gribov for their useful advice and discussions. There are 4 references, 0 of which are Soviet.

The Non-Conservation of Parity in the Process of the Capture of a Neutrino by Protons and Deuterons 56-34-4-32/60

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Physics and Technology, AS USSR)

SUBMITTED: December 9, 1957

1. B-particles--Decay 2. Pasitrons--Nuclear reactions
3. Neutrinos--Polarization

Card 3/3

AUTHOR: Anisovich, V. V. SOV/56-34-6-38/51

TITLE: The Calculation of the Lifetimes of the Excited States of Hf^{178} and Hf^{180} (Vychisleniye vremen zhizni vozbuzhdennykh sostoyaniy Hf^{178} i Hf^{180})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 6, pp. 1639-1641 (USSR)

ABSTRACT: The nuclei Hf^{178} and Hf^{180} have excited states which imply transitions to the level of the rotation band with the total moment I = 8. The lifetimes of these long-lived states are 3 sec and 5,5 hours. But the usual theoretical estimations of these lifetimes according to the model of the independent particles give values which are by 10^{16} times shorter. But in strongly deformed nuclei (to which belong Hf^{178} and Hf^{180}) there is a new quantum number K - the value of the projection of the total momentum to the symmetry axis of the nucleus. This implies the following selection rule for the γ-transitions in such nuclei: $\Delta K \leqslant L$, where L denotes the angular momentum of the emitted radiation. But this selection

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The Calculation of the Lifetimes of the Excited States of Hf^{178} and Hf^{180}

rule is not a strong one. The long lifetimes of the excited states of these nuclei may be explained by these selection rules with respect to K. For a numerical estimation of the transition probability with taking account of the above-mentioned selection rule some assumptions concerning the character of the interaction of the nucleons within the nucleus are necessary. The author uses the scheme of Nil'son which gives the right succession of the levels for an unpaired nucleon. Then he reports on the assumptions concerning the pair energy of the nucleons. The long-lived levels are the lowest excited states which are caused by the nucleon configuration. It can be assumed, therefore, that these long-lived levels were excited by the transition of one excited nucleon from the last occupied level to the following higher level. Then 3 expressions for the disturbations are given and discussed in a few words. The long-lived state of Hf^{180} is assumed to be caused by the transition of a neutron from the level 49 with $\Omega = -9/2$ to the level 48 with $\Omega = 7/2$. But the long-lived state of Hf^{178} is assumed to be the result of a neutron transition from the level 41 with $\Omega = 7/2$ to

SOV/56-34-6-38/51

The Calculation of the Lifetimes of the Excited States of Hf^{178} and Hf^{180}

the level 49 with $\Omega = -9/2$. The lifetimes calculated according to the method discussed in this paper are 30-40 times longer than the corresponding experimental values. The author thanks L. A. Sliv for his interest in this paper and K. A. Aristova who carried out the numerical computations. There are 5 references, 2 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut (Leningrad Physics and Technical Institute)

SUBMITTED: February 6, 1958

Card 3/3

Anisovich, V.V.

82604

S/056/60/039/01/15/029
B006/B070

24.6900

AUTHOR: Anisovich, V. V.

TITLE: A Resonance Model for the Reaction $\pi+N \rightarrow \pi+\pi+N$ for Meson Energies of 300-450 Mev

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 1 (7), pp. 97-104

TEXT: Since it has not yet been possible so far to make a field theoretical calculation of pion nucleon interaction, phenomenological models for the description of these reactions have to be used. In the introduction some publications on this topic are briefly mentioned including one of A. A. Ansel'm and V. N. Gribov (Ref. 1). In the present work the author attempts to calculate the cross section of the reaction mentioned in the title by using a resonance model which is based on the following assumptions: The kinetic energy of the particles produced lies in the range of from 100-200 Mev in the center of mass system. Let the pion-pion interaction be very small compared to the pion-nucleon resonance interaction in this range. Further let one of the pions produced in

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A Resonance Model for the Reaction $\pi+N \rightarrow \pi+\pi+N$ for Meson Energies of 300-450 Mev

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(3/2, 3/2) state and the nucleon have an energy which is in the neighborhood of the resonance energy; the energy of the second pion can then not be larger than 50 Mev as may be easily checked experimentally. Further, let the energy dependence of the matrix element be determined only by the resonance interaction of the nucleon and one of the pions in the final state (3/2, 3/2). These two particles have then the principal part of the energy, the (π,N) interaction at 50 Mev being negligibly small. Therefore, only a (π,N) interaction in the final state (3/2, 3/2) is to be investigated whose graph is shown in Fig. 1 and subsequently discussed. The recoil of the nucleons is equally negligible. The transition matrix element is expanded and then an expression for the cross section containing six parameters is derived. The cross sections for some particular cases are calculated by this formula and compared with the experimental data from Ref. 8. The theoretical formula has the form $(A_1+A_2)I_1+(B_1+B_2)I_2$ where the I are functions of the total energy, and A_i and B_i are cross sections. The comparison with experimental results is then made for the reaction $\pi^- + p \rightarrow \pi^+ + \pi^- + n$ for the energies 260, 320, 370 and 430 Mev (Fig. 2). Figs. 3 and 4 show pion angular distribution for the incident pions of energies 320 and 430 Mev. Agreement

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A Resonance Model for the Reaction $\pi+N \rightarrow \pi+\pi+N$ for Meson Energies of 300-450 Mev

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between theory and experiment is very good. In conclusion, the author thanks V. N. Gribov for suggesting the problem and A. A. Ansel'm for discussions. V. G. Zinov and S. M. Korenchenko are mentioned. There are 4 figures, 1 table, and 10 references: 5 Soviet, 3 American, 1 Italian, and 1 British.

ASSOCIATION: Leningradskiy fizikotekhnicheskiy institut Akademii nauk SSSR (Leningrad Physicotechnical Institute of the Academy of Sciences, USSR)

SUBMITTED: January 8, 1960

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86909

S/056/60/039/005/026/051
B006/B077

24.6900

AUTHOR: Anisovich, V. V.

TITLE: Resonance Model of the Reactions $N + \pi \rightarrow N + \pi + \pi$ and $\gamma + N \rightarrow N + \pi + \pi$

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 5(11), pp. 1357-1362

TEXT: In a previous study the authors have examined the reaction $N+\pi \rightarrow N+\pi+\pi$ at energies of the incident pion of from 300-450 Mev, making certain assumptions about the final states which are, however, no more justified for $E > 450$ Mev. In this paper the reaction is studied in a pion energy range of 300-550 Mev and the $\gamma + N \rightarrow N + \pi + \pi$ reaction at an energy of $E_{\gamma} = 450$-700 Mev. Here the interaction of both mesons with the nucleon has to be taken into consideration in the final state; this is done by applying the statistical nucleon approximation. The mass of the nucleons is assumed to be infinitely large. The authors assume as in Ref. 1 that the energy dependency of the matrix element is determined through the interaction of the particles in the final state only, and that the

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Resonance Model of the Reactions $N + \pi \rightarrow N + \pi + \pi$ and $\gamma + N \rightarrow N + \pi + \pi$

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meson-meson interaction is very small. It is also assumed that the additional meson originates in such a way that one of the mesons and the nucleon are in a resonance state in the final state (3/2, 3/2), another meson being taken with momentum L, which is either vanishing or equal to unity; if L=1, a resonance interaction of the latter meson with the nucleon is possible. This interaction leads to the appearance of an additional factor in the transition amplitude: $q_2^{-2}\sin\delta(q_2)$, where q_2 denotes the momentum of the last mentioned meson, and $\delta(q)$ is the meson-nucleon scattering phase in the state (3/2, 3/2). The problem is examined as to which transitions describe these reactions best and the reaction cross sections are also studied. The following holds for the $(N\pi)$ reaction in the c.m.s. system: $4\pi d\sigma/d\Omega = b_0 + b_1\cos\theta + b_2(3\cos^2\theta - 1)/2$; $b_0 = (A_1 + A_2)I_1 + BI_2$, $b_1 = CI_3$, $b_2 = DI_1 + EI_2$. I_1, I_2, I_3 are only a function of the total energy ε of the system (cf. Table; E_π and E_γ are measured in the laboratory system). The coefficients A_1, A_2 ... E are dependent on the type of reaction and the angular distribution in question, this

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Resonance Model of the Reactions $N + \pi \rightarrow N + \pi + \pi$ and $\gamma + N \rightarrow N + \pi + \pi$

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relationship is given in an appendix. For the (γN) reaction $\sigma = AI_1$, which agrees well with experimental results (where A = 49 mb). It can be seen that the simple model used in Ref. 1 in which it is assumed that the meson production in meson-nucleon interaction proceeds mainly via the transition $D_{3/2} - P_{3/2}S_{3/2}$ satisfies all available experimental data. Balusov, Bogachev and Sidorov are mentioned. There are 1 figure, 1 table, and 7 references: 3 Soviet, 3 US, and 1 Italian.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Physics and Technology of the Academy of Sciences USSR)

SUBMITTED: June 9, 1960

ε	E_{π} лаб, MeV	E_{γ} лаб, MeV	$\bar{L}_1$	I	I	I	I
2,65	290	450	0,2	0,005	0,03	0,042	0,154
2,9	340	500	0,4	0,018	0,08	0,09	0,30
3,1	380	540	0,9	0,049	0,20	0,24	0,66
3,3	420	575	1,3	0,110	0,35	0,43	0,86
3,5	470	620	1,6	0,190	0,55	0,70	0,90
3,7	510	660	1,7	0,200	0,60	1,00	0,76

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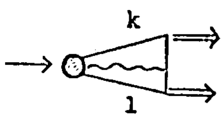
S/056/61/041/006/037/054
B125/B102

AUTHOR: Anisovich, V. V.

TITLE: Dispersion representation of the deuteron form factor

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 6(12), 1961, 1907-1914

TEXT: The author studies the second anomalous singularity at $s \sim 9\ \mu^2$ of the deuteron form factor. The most complex of the various possible graphs of the deuteron form factor is studied, i.e.,



(---- photon, ~~~- meson, —— nucleon, ▬▬ - deuteron.)

The dispersion representation for this graph is sought. The dispersion representation of the vertex part with lacking anomalous singularities is

$$\frac{1}{\pi}\int_{m^2}^{\infty}\frac{\varphi(s')}{s'-s}\,ds', \qquad (1)$$

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where m is the least possible sum of the intermediary masses. If the masses change, the counters are deformed by the singularities in the absorption part of $\varphi(s)$. Fig. 2 shows the deformation of the contours of the dispersion integral of the graphs shown in Fig. 1. The dispersion representation of the Landau graph (Fig. 2) is

$$\frac{1}{\pi}\int_{s_0}^{(2M+\mu)^2} ds' \frac{\Delta\varphi(s')}{s'-s} + \frac{1}{\pi}\int_{(2M+\mu)^2}^{\infty} ds' \frac{\varphi(s')}{s'-s}. \qquad (2)$$

$$s_0 = 4\mu^2 + 16M\mu\sqrt{\frac{\varepsilon}{M}\left(1-\frac{\mu^2}{4M^2}\right)},$$

where $\Delta\varphi(s)$ is the jump of the absorption part at different boundaries of the section due to the singularity a (Fig. 3). The absorption part at $s > 4D^2$ can be analytically continued up to $s \sim 9\mu$. Thus, the discontinuity of the absorption part of the studied graph can be determined. With physical μ, D, and $4\mu^2 + 16M\mu\sqrt{\varepsilon(1-\mu^2/4M^2)/M} < s < 16\mu^2 . 1/2$

$$\int_{\sigma_{II}}^{\sigma_V} d\sigma_1 \{[\sigma_1 - (D-M)^2][-\sigma_1 + (D+M)^2]\}^{-1/2}; \qquad (5)$$

with
$$-\Delta\varphi(s) = \varphi(s+i\varepsilon) - \varphi(s-i\varepsilon) =$$
$$= \frac{\pi^2}{16}\frac{1}{\sqrt{s(s/4-D^2)}}\int_{\sigma_{II}}^{\sigma_V} d\sigma_1 \frac{(-2\pi i)^2}{(\sigma_1[(\sigma_1 - M^2 + D^2)^2/4\sigma_1 - D^2])^{1/2}}; \qquad (4)$$
$$\sigma_{II} = s/2 + M^2 - [s(s/4 - D^2)(1 - 4M^2/D^2)]^{1/2},$$
$$\sigma_V = M^2 + D^2\mu^2/2M^2 + [4D^2\mu^2(1 - D^2/4M^2)(1 - \mu^2/4M^2)]^{1/2}.$$
is obtained. With $s = 4\mu^2 + 16 M\mu\left[\varepsilon(1 - \mu^2/4M^2)/M\right]$ $\Delta\varphi$ is found to vanish. The factor
$$\frac{1}{\pi}\int_{z_-}^{z_+} dz\,[(z_1^2-1)(z_2^2-1) - (z - z_1z_2)^2]^{-1/2}; \qquad (6a) \text{ with}$$
$$z_\pm = z_1z_2 \pm \sqrt{(z_1^2-1)(z_2^2-1)},$$

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Dispersion representation of ... S/056/61/041/006/037/054
B125/B102

$$\sigma_2 = M^2 + s - \frac{1}{2\sigma_1}(\sigma_1 + M^2 - \mu^2)(\sigma_1 + s - M^2) + 2z\left\{\left[\frac{(\sigma_1 + M^2 - \mu^2)^2}{4\sigma_1} - M^2\right]\left[\frac{(\sigma_1 + s - M^2)^2}{4\sigma_1} - s\right]\right\}^{1/2},$$

$$0 = D^2 - \frac{1}{2\sigma_1}(\sigma_1 + M^2 - \mu^2)(\sigma_1 - M^2 + D^2) + 2z_1\left\{\left[\frac{(\sigma_1 - M^2 + D^2)^2}{4\sigma_1} - D^2\right]\left[\frac{(\sigma_1 + M^2 - \mu^2)^2}{4\sigma_1} - M^2\right]\right\}^{1/2}, \quad (66)$$

$$0 = s - \frac{1}{2\sigma_1}(\sigma_1 + s - M^2)(\sigma_1 - M^2 + D^2) + 2z_2\left\{\left[\frac{(\sigma_1 + s - M^2)^2}{4\sigma_1} - s\right]\left[\frac{(\sigma_1 - M^2 + D^2)^2}{4\sigma_1} - D^2\right]\right\}^{1/2}.$$

to be introduced under the integral of (5) equals unity. The following has to be observed for the further calculation of the absorption part of this graph: When determining the discontinuity of the absorption part of the jump, masses must be used with which each vertex of this graph may completely decay. In the absorption part of this graph the factor of the type $(k^2-m^2)^{-1}$ are then to be replaced by $(-2\pi i)\delta(k^2-m^2)$. The method

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described here is suited also for four-vertex graphs. The author refers to a private communication by V. N. Gribov and I. T. Dyatlov. V. N. Gribov, G. S. Danilov and I. T. Dyatlov are thanked for discussions. There are 8 figures and 4 non-Soviet references. The four references to English-language publications read as follows: L. D. Landau. Nucl. Phys., 13, 181, 1959; S. Mandelstam. Phys. Rev. Lett., 4, 84, 1960; P. E. Cutkovsky, J. of Math. Phys., 1, 429, 1960; R. Karplus et al. Phys. Rev. 111, 1187, 1958.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physicotechnical Institute of the Academy of Sciences USSR)

SUBMITTED: July 6, 1961

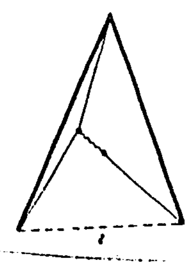

Fig. 1

APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000101630005-5"

S/056/62/042/001/035/048
B125/B102

AUTHORS: Anisovich, V. V., Ansel'm, A. A., Gribov, V. N.

TITLE: Contribution to the theory of the $\pi + N \rightarrow N + \pi + \pi$ and $\gamma + N \rightarrow N + \pi + \pi$ reactions near the threshold

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 1, 1962, 224-235

TEXT: The amplitudes and cross sections of the reactions $\pi + N \rightarrow N + \pi + \pi$ and $\gamma + N \rightarrow N + \pi + \pi$ are considered with an accuracy to terms quadratic in threshold momenta. The dependence of the cross sections on the kinetic energy of the corresponding particles is expressed in an explicit form by separating the terms that are linear with respect to the relative momenta from the energy dependence of the cross section. At sufficiently small M^2 the dispersion relation

$$A(S_{23}, M^2) = A((m_2 + m_3)^2, M^2) + \frac{S_{23} - (m_2 + m_3)^2}{\pi} \int\limits_{(m_2+m_3)^2}^{\infty} \frac{A_1(S', M^2)\, dS'}{[S' - (m_2 + m_3)^2]\,[S' - S]} \quad (1)$$

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S/056/62/042/001/035/048
B125/B102

Contribution to the theory ...

corresponds to the graph shown in Fig. 1. This graph is mainly triangular, and depends on the square of the energy (M^2) of the incident particles in the center-of-mass system and on the square of the energy S_{23} of the particles 2 and 3 in their center-of-mass system. The lower integration boundary of (1) is $S_{23} = (m_2 + m_3)^2$. (1) is affected by the anomalous singularities occurring if M^2 increases, although it keeps its form for $M^2 > (m_1 + m_2 + m_3)$, $A_1(S_{23}, M^2)$ becomes complex in the interval $(m_2 + m_3)^2 < S_{23} < (M - m_1)^2$. Using the unitarity condition

(2)

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S/056/62/042/001/035/048
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Contribution to the theory ...

which holds in the channel S_{23} and the dispersion relation

$$B(t) = \frac{t-(m_1+m_2)^2}{\pi} \int\limits_{(m_1+m_2)^2}^{\infty} \frac{B_1(t')\,dt'}{[t'-(m_1+m_2)^2]\,[t'-t]} \quad (4)$$

for the variable t the authors obtain

$$A_1(\varkappa^2) = -\lambda a_{12}a_{23}\sqrt{\frac{m_1m_2m_3}{m_1+m_2+m_3}}\,\frac{\varkappa^2}{\mu_{23}}\,\frac{1}{6}(1+2\beta_2). \quad (13)$$

and

$$A(\varkappa^2) = -\lambda a_{12}a_{23}\sqrt{\frac{m_1m_2m_3}{m_1+m_2+m_3}}\,\frac{1}{6}(1+2\beta_2)\,\frac{\varkappa^2}{\mu_{23}}\,\frac{1}{\pi}\ln\frac{\mu^2}{\varkappa^2} \quad (14)$$

from (1) for the diagram of Fig. 1 again shown in Fig. 4. A_1 denotes the absorption part.

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$$M = M_0 \{1 + ik_{12}a_{12} + ik_{13}a_{13} + ik_{23}a_{23} + a_{12}a_{13} [J_1(k_{12}) + J_1(k_{13}) + \mathcal{K}_1(k_{12}) + \mathcal{K}_1(k_{13})] + a_{12}a_{23} [J_2(k_{12}) + J_2(k_{23}) + \mathcal{K}_2(k_{12}) + \mathcal{K}_2(k_{23})] + a_{13}a_{23} [J_3(k_{13}) + J_3(k_{23}) + \mathcal{K}_3(k_{13}) + \mathcal{K}_3(k_{23})] + C_1k_{12}^2 + C_2k_{13}^2 + C_3k_{23}^2\};$$

$$J_\alpha(k_{il}) = I_\alpha(x_{il}), \qquad \mathcal{K}_\alpha(k_{il}) = K_\alpha(x_{il}), \qquad x_{il} = k_{il}/\sqrt{2\mu_{il}E},$$

$$E = M - m_1 - m_2 - m_3, \qquad \beta_1 = m_1(m_1 + m_2 + m_3)/(m_1 + m_2)(m_1 + m_3), \tag{15}$$

$$I_\alpha(x) = -2E\sqrt{\frac{m_1m_2m_3}{m_1+m_2+m_3}}\frac{2x \arccos x}{\pi\sqrt{1-x^2}}\left[\beta_\alpha + x^2\frac{1-4\beta_\alpha}{3}\right],$$

$$K_\alpha(x) = -2E\sqrt{\frac{m_1m_2m_3}{m_1+m_2+m_3}}\frac{1}{\pi}\ln\frac{\mu}{E}\left[\frac{1}{6}(1+2\beta_\alpha) - x^2\frac{1-4\beta_\alpha}{3}\right].$$

gives the total amplitude of the process $M \to m_1, m_2, m_3$ which is exact to the quadratic terms. The residual term in the dispersion relation for the function $A(0,K^2)$ contributes to the amplitude of the process only at zero energy. The total cross section

$$\sigma = \text{const}\cdot E^2 \left[1 + AE\ln(\mu/E) + BE\right],$$

$$A = -\frac{8}{\pi}\sqrt{\frac{m_1 m_2 m_3}{m_1 + m_2 + m_3}}\left[a_{12}a_{13}\beta_1 + a_{12}a_{23}\beta_2 + a_{13}a_{23}\beta_3\right]. \qquad (17)$$

is obtained from the differential cross section of the reaction after integration over the phase volume. Such an energy dependence is observed in the production of two pions by one positive pion and a γ-quantum on a proton. The total cross section of pion production by negative pions and γ-quanta contains, however, terms $\sim E^2\sqrt{E}$. In the second part of the present paper this theory developed for neutral particles is applied to the production of two pions by pions and γ-quanta on nucleons. In the corresponding results only the charges of the corresponding particles have to be considered. The reactions $\pi^- + p \longrightarrow \pi^+ + \pi^- + n$ (18.1), $\pi^- + p \longrightarrow \pi^0 + \pi^0 + n$ (18.2), $\pi^- + p \longrightarrow \pi^- + \pi^0 + p$ (18.3) have the squares

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$$|\langle\pi^+\pi^-n|S|\pi^-p\rangle|^2 = \rho_1^2\{1 + k_{12}\alpha_{12}a_e + 2k_{13}\alpha_{13}b_e + \beta_1[k_{12}k_{13} + J_1(k_{12}) + J_1(k_{13})] + \beta_2[k_{12}k_{23} + J_1(k_{12}) + J_1(k_{23})] + \beta_3[k_{13}k_{23} + J_3(k_{13}) + J_3(k_{23})] + \beta_4[J_1(k_{12}) + J_1(k_{13})] + \beta_5 J_3(k_{13}) + C_1k_{12}^2 + C_2k_{13}^2\}; \quad (23.1),$$

$$\beta_1 = 2(a_s + \tfrac{1}{2}\beta_{12}a_e)(b_s + \beta_{13}b_e) + \alpha_{12}\alpha_{13}a_eb_e,$$

$$\beta_2 = 2(a_s + \tfrac{1}{2}\beta_{12}a_e)b_{e}, \qquad \beta_3 = 2(b_s + \beta_{13}b_e)b_{e},$$

$$\beta_4 = 2a_eb_e\beta_{13} - a_eb_e(\beta_{12}\beta_{13} + \alpha_{12}\alpha_{13}), \quad \beta_5 = 2(b_e)^2(\beta_{12} - \sqrt{2}\beta_{13}).$$

$$|\langle\pi^0\pi^0n|S|\pi^-p\rangle|^2 = \rho_2\{1 + 2k_{12}\alpha_{21}a_e + 2(k_{13} + k_{23})\alpha_{23}b_e + \gamma_1[k_{12}(k_{13} + k_{23}) + 2J_1(k_{12}) + J_1(k_{13}) + J_1(k_{23})] + \gamma_2[k_{13}k_{23} + J_3(k_{13}) + J_3(k_{23})] + \gamma_3[2J_1(k_{12}) + J_1(k_{13}) + J_1(k_{23})] + \gamma_4[J_3(k_{13}) + J_3(k_{23})] + D_1k_{12}^2\};$$

$$\gamma_1 = 2\alpha_{21}\alpha_{23}a_eb_e + 2(\tfrac{1}{2}a_s^0 + \beta_{21}a_e)(b_s^0 + \beta_{23}b_e),$$

$$\gamma_2 = 2(b_s^0 + \beta_{23}b_e)^2, \quad \gamma_3 = -2(\alpha_{21}\alpha_{23} + \beta_{21}\beta_{23})a_eb_e + \beta_{23}a_eb_e, \quad (23.2), \text{ and}$$

$$\gamma_4 = 2(b_e)^2(\beta_{21} - \beta_{23}^2).$$

$$|\langle\pi^-\pi^0p|S|\pi^-p\rangle|^2 = \rho_3^2\{1 + 2k_{13}\alpha_{33}b_e + 2k_{23}\alpha_{31}b_e + \delta_1[k_{12}k_{13} + J_1(k_{12}) + J_1(k_{13})] + \delta_2[k_{12}k_{23} + J_1(k_{12}) + J_1(k_{23})] + \delta_3[k_{13}k_{23} + J_3(k_{13}) + J_3(k_{23})] + \delta_4[J_1(k_{13}) - J_1(k_{23})] + \delta_5J_3(k_{13}) + \delta_6J_3(k_{23}) + F_1k_{12}^2 + F_2k_{13}^2;$$

$$\delta_1 = 2a_s(b_s + \beta_{32}b_e), \quad \delta_2 = 2a_s(b_s^0 + \beta_{31}b_e),$$
$$\delta_3 = 2(b_s + \beta_{32}b_e)(b_s^0 + \beta_{31}b_e) + 2\alpha_{31}\alpha_{32}(b_e)^2,$$
$$\delta_4 = 2a_e b_e\left(\beta_{31} - \frac{1}{2}\beta_{32}\right), \quad \delta_5 = 2(b_e)^2[1 - \alpha_{31}\alpha_{32} - \beta_{31}\beta_{32}],$$
$$\delta_6 = -2(b_e)^2[\alpha_{31}\alpha_{32} + \beta_{31}\beta_{32}] + 2\beta_{31}(b_e)^2\sqrt{2}. \qquad (23.3)$$

(23.3)

of the matrix elements and the amplitudes

$$\lambda_1 = -\frac{\sqrt{2}}{3}F_{11}e^{i\delta_{11}} + \frac{1}{3\sqrt{5}}F_{31}e^{i\delta_{31}}, \qquad (27)$$
$$\lambda_2 = \frac{\sqrt{2}}{3}F_{11}e^{i\delta_{11}} + \frac{2}{3\sqrt{5}}F_{31}e^{i\delta_{31}}, \quad \lambda_3 = -\frac{1}{\sqrt{10}}F_{31}e^{i\delta_{31}}.$$

(27).

$$\left\langle \tfrac{1}{2}\ 0|S|\tfrac{1}{2}\right\rangle = F_{11}e^{i\delta_{11}}, \quad \left\langle \tfrac{3}{2}\ 2|S|\tfrac{3}{2}\right\rangle = F_{31}e^{i\delta_{31}}, \qquad (26)$$

denote the isotopically invariant matrix elements of the production of two pions in states with $T = 0$ (total isotopic spin 1/2) and with $T = 2$ (total spin 3/2). The amplitudes of the photoproduction of two pions at zero energy λ_i are expressed by the matrix elements of photoproduction in states with total isotopic spins 1/2 and 3/2 at a total angular momentum of -1/2. Also the amplitudes of the two reactions $\pi^+ + p \rightarrow \pi^+ + \pi^+ + n$ and $\pi^+ + p \rightarrow \pi^+ + \pi^0 + p$ at zero energy can be expressed by the already mentioned matrix element of the production of one pion in a state with the total isotopic spin 3/2. The total $\pi^{\pm}p$ interaction cross sections are

$$\sigma(\pi^+\pi^-p \mid \pi^-p) = p_1^2E^2(1 + A_1\sqrt{E} + B_1E\ln(\mu/E)),$$
$$\sigma(\pi^0\pi^0n \mid \pi^-p) = p_2^2E^2(1 + A_2\sqrt{E} + B_2E\ln(\mu/E)),$$
$$\sigma(\pi^-\pi^0p \mid \pi^-p) = p_3^2E^2(1 + A_3\sqrt{E} + B_3E\ln(\mu/E));$$

$$A_1 = \frac{32}{15\pi}\left(\alpha_{12}a_e + 2\sqrt{\frac{2M}{M+1}}\alpha_{13}b_e\right), \qquad A_2 = \frac{32}{15\pi}\left(2\alpha_{21}a_e + 4\sqrt{\frac{2M}{M+1}}\alpha_{23}b_e\right) \quad (35)$$ and

$$A_3 = \frac{32}{15\pi}\left(2\alpha_{32}b_e + 2\sqrt{\frac{2M}{M+1}}\alpha_{31}b_e\right),$$

$$B_1 = -\frac{4}{\pi}\frac{\sqrt{M(M+2)}}{M+1}\left[2a_s b_s^0 + \beta_{12}a_e b_s^0 + \beta_{13}a_2 b_e\right] - \frac{8}{\pi}\frac{M\sqrt{M(M+2)}}{(M+1)^2}\left[b_s b_{s/s} + \frac{1}{2}\beta_{11}(b_e)^2 + \beta_{13}b_s^0 b_e\right],$$

$$B_2 = -\frac{4}{\pi}\frac{\sqrt{M(M+2)}}{M+1}\left[a_s^0 b_s^0 + 2\beta_{21}a_e b_s^0 + 2\beta_{23}a_2 b_e\right] - \frac{8}{\pi}\frac{M\sqrt{M(M+2)}}{(M+1)^2}\left[(b_s^0)^2 + \beta_{21}(b_e)^2 + 2\beta_{23}b_s^0 b_e\right],$$

$$B_3 = -\frac{4}{\pi}\frac{\sqrt{M(M+2)}}{M+1}\left[a_2(b_s^0 + b_s) + \beta_{31}a_2 b_e + \beta_{32}a_2 b_e\right] - \frac{8}{\pi}\frac{M\sqrt{M(M+2)}}{(M+1)^2}\left[b_s b_s^0 + \frac{1}{2}(b_e)^2 + \beta_{31}b_s^0 b_e + \beta_{32}b_s^0 b_e\right].$$

$$\sigma(\pi^+\pi^+n \mid \pi^+p) = \frac{4}{5}|F_{31}|^2 E^2\left(1 + BE \ln\frac{\mu}{E}\right),$$

$$\sigma(\pi^+\pi^0p \mid \pi^+p) = \frac{1}{10}|F_{31}|^2 E^2\left(1 + B'E \ln\frac{\mu}{E}\right);$$

$$B = -\frac{4}{\pi}\frac{\sqrt{M(M+2)}}{M+1}\left[2a_2\left(\frac{1}{6}b_{1/2} + \frac{5}{6}b_{3/2}\right)\right] - -\frac{8}{\pi}\frac{M\sqrt{M(M+2)}}{(M+1)^2}\left[\frac{1}{9}\left(5b^2_{1/2} + 5b_{1/2}b_{3/2} - b^2_{3/2}\right)\right], \quad B' = B. \qquad (36).$$

The authors thank G. S. Danilov and I. I. Dyatlov for valuable discussions. There are 4 figures and 10 references: 6 Soviet and 4 non-Soviet. The three references to English-language publications read as follows: V. N. Gribov. Nucl. Phys., 5, 653, 1958; S. Mandelstam. Phys. Rev. Lett., 4, 84, 1960; P. V. Landshoff, S. B. Treiman. Nuovo Cim., 19, 1249, 1961; R. E. Cutkosky. Journ. Math. Phys., 1, 429, 1960.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut (Leningrad Physicotechnical Institute)

SUBMITTED: July 29, 1961

S/056/62/043/003/026/063
B102/B104

AUTHORS: Anisovich, V. V., Ansel'm, A. A., Gribov, V. N., Dyatlov, I. T.

TITLE: Anomalous thresholds and interaction in the final state

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 3(9), 1962, 906-908

TEXT: The authors study the influence of anomalous three-particle production amplitude singularities on the analytical amplitude properties when two of the particles have small energies. It is shown from the example of meson production in meson-nucleon collisions (graph Fig. 1) that the presence of anomalous terms in the dispersion relations do not influence the amplitude expansion in a power series of the threshold momenta. This graph has a logarithmic singularity at $s = 4\mu^2$ (Sawyer, Phys. Rev. Lett. 7, 213, 1961) and an anomalous one at

$$s_b = \frac{\mu^2(W + 3M^2 - \mu^2)}{2M^2} - i\frac{\mu}{2M^2}\sqrt{4M^2 - \mu^2}\,[W^2 - 2W(M^2 + \mu^2) + (M^2 - \mu^2)^2]^{1/2}, \quad (1)$$

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Anomalous thresholds and interaction ...

where $W = (k_1+p_1)^2$ is the total energy of the system in the c. m. s., M the nucleon mass and μ the meson mass. For super-threshold energies $W > (M+2\mu)^2$ in dispersion representation

$$A(s) = \frac{1}{\pi}\int_C \frac{A_1(s')\,ds'}{s'-s} = \frac{1}{\pi}\int_{s_0}^{4\mu^2} \frac{\rho(s')\,ds'}{s'-s} + \frac{1}{\pi}\int_{4\mu^2}^{\infty} \frac{A_1(s')\,ds'}{s'-s}; \quad \rho(s') = A_1^+(s') - A_1^-(s'). \qquad (2,3)$$

With this separation the logarithmic singularity of the first integral is compensated by the second, so that $A_1(s)$ is determined by the unitarity condition for $s > (\sqrt{W} + M)^2$. For smaller s it is possible to obtain $A_1(s)$ as analytic continuation from the region $s > (\sqrt{W}+M)^2$. For point vertices and $s > (\sqrt{W}+M)^2$,

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$$A_1(s) = \{s/[s-(\sqrt{W}-M)^2][s-(\sqrt{W}+M)^2]\}^{1/2} \times$$
$$\times \ln \frac{s-W+M^2-2\mu^2-\sqrt{(s-4\mu^2)/s}\{[s-(\sqrt{W}-M)^2][s-(\sqrt{W}+M)^2]\}^{1/2}}{s-W+M^2-2\mu^2+\sqrt{(s-4\mu^2)/s}\{[s-(\sqrt{W}-M)^2][s-(\sqrt{W}+M)^2]\}^{1/2}} \quad (4).$$

The amplitude discontinuity at $s = 4\mu^2$ tends to zero as $\sqrt{s-4\mu^2}$. Finally the behavior of the singularity of (4) at $\sqrt{W} \approx M+2\mu$ for the production of three low-energy particles is discussed. There are 3 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR)

SUBMITTED: March 6, 1962

15371

S/056/63/044/001/036/067
B111/B102

24.6610

AUTHORS: Anisovich, V. V., Dakhno, L. G.

TITLE: Angular distribution of three particles produced near the threshold

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 1, 1963, 198 - 202

TEXT: The production amplitude of three particles with a total orbital angular momentum $L > 0$ ($L=1$ and $L=2$) is studied near the threshold. The amplitude is expanded with respect to the momenta of the particles produced and is calculated in second approximation. These momenta refer to the relative movement of the particles produced. The amplitude depends on five independent invariants, s_{12}, s_{13}, s_{23}, where

$s_{il} = (\sqrt{m_i^2 + k_i^2} + \sqrt{m_l^2 + k_l^2})^2 - (\vec{k}_i + \vec{k}_l)^2$ and t_1, t_2 where

$t_i = (\omega - \sqrt{m_i^2 + k_i^2})^2 - (\vec{P} - \vec{k}_i)^2$ and ω, $\vec{P}$ are the total energy and the total

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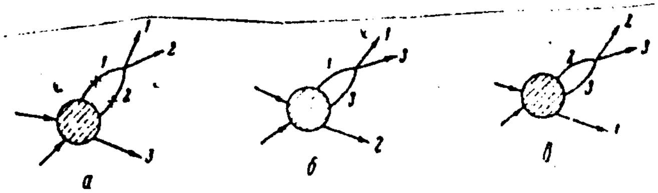
Angular distribution of ...

momentum of a particle in the initial state. The expansion of s_{il} and t_i with respect to the momenta yields

$$A(k_{12}k_{13}k_{23}z_1z_2) = A_0(k_{12}k_{13}k_{23}) + A_{10}(k_{12}k_{13}k_{23})k_1z_1 + A_{01}(k_{12}k_{13}k_{23})k_2z_2 + A_{20}(k_{12}k_{13}k_{23})k_1^2z_1^2 + A_{11}(k_{12}k_{13}k_{23})k_1k_2z_1z_2 + A_{02}(k_{12}k_{13}k_{23})k_2^2z_2^2 + \ldots \quad (1)$$

for the production amplitude. k_{il} is the relative momentum of the i-th and l-th particles. A_{01} and A_{10} are calculated with the aid of dispersion relations of the graphs



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B111/B102

$$A_1k_1z_1 + A_2k_2z_2 + A_3k_3z_3 =$$
$$k_3z_3\left[\alpha_3 + ik_{12}a_{12}\left(\alpha_3 - \frac{m_1}{m_1+m_2}\alpha_1 - \frac{m_2}{m_1+m_2}\alpha_2\right)\right] +$$
$$+ k_2z_2\left[\alpha_2 + ik_{13}a_{13}\left(\alpha_2 - \frac{m_1}{m_1+m_3}\alpha_1 - \frac{m_3}{m_1+m_3}\alpha_3\right)\right] +$$
$$+ k_1z_1\left[\alpha_1 + ik_{23}a_{23}\left(\alpha_1 - \frac{m_2}{m_2+m_3}\alpha_2 - \frac{m_3}{m_2+m_3}\alpha_3\right)\right]. \quad (9)$$

is obtained for the production amplitude with L=1, where α_1 is the zeroth approximation of A_1 and $\alpha_e = \rho_e e^{i\delta}$; ρ_e is the interaction constant, δ is the particle scattering phase in the initial state, a_{ik} is the scattering length of the particles i and k. For L = 2 the amplitude is determined by three independent constants. The calculations in first approximation contribute only little to the process $\pi + N \to N + \pi + \pi$. This is not valid, however, for other reactions, e.g. $K + N \to N + K + \pi$. There are 2 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR)

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Angular distribution of.... S/056/63/044/001/036/067
B111/B102

SUBMITTED: July 7, 1962

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L 10209-63 EPF(n)-2/EWT(m)/BDS--AFFTC/ASD/
SSD--Pu-4

ACCESSION NR: AP3000055 S/0056/63/044/005/1593/1602

60
57

AUTHOR: Anisovich, V. V.

TITLE: Positive-kaon to three pion decay and pion-pion interaction.

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 44, no. 5, 1963, 1593-1602

TOPIC TAGS: kaon to pion decay, pion-pion interaction, dispersion relations, strong interactions

ABSTRACT: Experimental data for the 3 Pi decay mode of the positive kaon are compared with formulas obtained on the assumption that the selection rule DELTA T = 1/2 holds, and that the s-wave scattering lengths of the pions in states with isotopic spins 0 and 2 are less than or nearly equal to unity. It is shown that these formulas agree with experiment when these scattering lengths are small, but owing to the large experimental errors it is impossible to draw any conclusions about the values of these scattering lengths. Dispersion relations are then written for the K-decay amplitudes without assuming the s-wave scattering lengths to be small. The dispersion relations written by

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ACCESSION NR: AP3000055

3

Khuri and Treiman for the K -- 3 Pi reaction are discussed in connection with the integral equation for the K-decay amplitudes. The integration equation obtained has a unique solution and can be solved numerically. "The author is deeply grateful to A. A. Ansel'm and G. S. Danilov for useful discussions." Orig. art. has: 24 formulas and 3 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences SSSR)

SUBMITTED: 04Dec62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NR REF SOV: 007 OTHER: 011

Card 2/2

ACCESSION NR: AP4025955 S/0056/64/046/003/1152/1155

AUTHOR: Anisovich, V. V.; Dakhno, L. G.

TITLE: Concerning the character of interaction at low energies of pions from the reactions $p + d \to He^3 + 2\pi$ and $\pi + N \to N + 2\pi$

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 46, no. 3, 1964, 1152-1155

TOPIC TAGS: pion deuteron reaction, pion nucleon reaction, production amplitude, logarithmic singularity, logarithmic singularity location, pion production probability, pion scattering length

ABSTRACT: It is shown that the difference between the behavior of the energy distributions with respect to $s^{1/2}$ (the total c.m.s. energy of the produced pions) in the reactions $p + d \to He^3 + 2\pi$ and $\pi + N \to N + 2\pi$ at $s^{1/2} \sim 2$ can be attributed to the presence near $s = 4$ of a logarithmic singularity in the production amplitudes, discovered by Aitchison (Logarithmic Singularities in Processes with Two Final State Interactions, Preprint, 1963). The location of Aitchison's logarithmic singularity depends on the total energy of the system, and its effect on the two foregoing reactions is discussed in detail. It is shown that the

ACCESSION NR: AP4025955

closeness of the logarithmic singularity to the physical region can lead to two different effects: (1) a sharp increase in the probability of pion production when s is close to 4, or (2) to an equally sharp decrease in the probability of production at $s \approx 4$. The facts obtained serve as further evidence against the deductions by A. Abashian et al. (Phys. Rev. letters v. 5, 258, 1960) that the scattering length (a_0) is a large quantity. To the contrary $a_0 \lesssim 1$. Orig. art. has: 1 formulas and 2 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR (Physico-technical Institute AN SSSR)

SUBMITTED: 14Jan64 DATE ACQ: 16Apr64 ENCL: 01

SUB CODE: PH NR REF SOV: 003 OTHER: 008

Card 2/3

ACCESSION NR: AP4031152 S/0056/64/046/004/1307/1319

AUTHORS: Anisovich, V. V.; Dakhno, L. G.

TITLE: Three particle production near threshold with resonance interaction of two particles

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1307-1319

TOPIC TAGS: particle production, elementary particle, resonant scattering, nucleon scattering, nucleon collision, nucleon interaction.

ABSTRACT: The cross sections of the reaction N + N → N + N + p near threshold are calculated and it is shown that the Watson-Migdal formula (K. M. Watson, Phys. Rev. v. 88, 1163, 1952; A. B. Migdal, ZhETF v. 28, 10, 1955), which describes such reactions near threshold, can be used to analyze three-particle production near threshold in the case of resonance interaction between two of the particles. The corrections of order $E^{1/2}$ to the Watson-Migdal formula are obtained

ACCESSION NR: AP4031152

by a dispersion technique, and depend both on the relative momenta of the produced particle and on the total kinetic energy. The production of three neutral spinless particles with different masses is considered first, in which case the corrections of order $E^{1/2}$ have the form of definite simple integrals. This is followed by an analysis of reactions in which the masses of the resonant interacting particles are much larger than the mass of the third particle, in which case the corrections can be calculated in a general form in terms of analytic functions. The corrections are given in terms of the threshold-energy three-particle production amplitude, effective radius, and scattering lengths of the production particles. "The authors are grateful to A. A. Ansel'm for a discussion of several problems." Orig. art. has: 10 figures and 26 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences SSSR)

Card 2/3

ACCESSION NR: AP4042395 S/0056/64/047/001/0240/0247

AUTHOR: Anisovich, V. V.

TITLE: K -- 3 Pi decay and the interaction between pions at low energies

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 1, 1964, 240-247

TOPIC TAGS: pion, pion pion interaction, K meson, meson reaction, energy distribution, angular distribution

ABSTRACT: The dispersion equation obtained by the author earlier (ZhETF v. 44, 1593, 1962) for the amplitude of the K-3π decay, is solved in the present article with the aid of an iteration procedure for the case when a_0 is large and $a_2 = 0$ (a_T -- pion scattering length in a state with isotopic spin T). The energy and angular distributions obtained in this manner for the reactions $K^{\pm} \rightarrow 2\pi^{\pm} + \pi^{\pm}$ are compared with the experimental data for $a_0 = 1, 2, 3$ and it is

ACCESSION NR: AP4042395

found that theory and experiment agree well only if $a_0 = 1$, thus indicating that a_0 is of the order of unity or less. This contradicts the earlier results which implied that a_0 is small. It is therefore concluded that to obtain more accurate information on the character of pion interaction at low energies by using the formulas derived in the present paper (or the formulas derived in the earlier paper) can be obtained only if the experimental accuracy is increased. "The author is deeply grateful to A. A. Ansel'm and G. S. Danilov for useful discussions and to T. Yu. Andriyevskaya and N. V. Koroleva for the numerical calculations." Orig. art. has: 5 figures, 8 formulas, and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences, SSSR)

SUBMITTED: 14Jan64

ENCL: 00

SUB CODE: NP NR REF SOV: 002 OTHER: 004

ACCESSION NR: AP4043658 S/0056/64/047/002/0771/0773

AUTHORS: Anisovich, V. V.; Moskalev, A. N.; Fomin, V. V.

TITLE: Influence of logarithmic singularities on the parameters of certain resonances

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 2, 1964, 771-773

TOPIC TAGS: resonance scattering, omega meson, sigma particle, pion, rho meson

ABSTRACT: The purpose of this note is to call attention to the fact that resonances in the systems $\rho\pi$ (A-resonance), $\omega\pi$ (B-resonance), and $\Sigma\pi$ (Y_0^*-resonance) were investigated in the past in the majority of cases under conditions in which the spectra of the particles $\rho\pi$, $\omega\pi$, and $\Sigma\pi$, in the region of resonant values of energy could be strongly influenced by logarithmic singularities of the type indicated by I. J. R. Aitchison, (Phys. Rev. v. 133, B1257, 1964).

L 65255-65 EWT(m)/T/EWA(m)-2

ACCESSION NR: AP5014203 UR/0386/65/001/002/0050/0054

AUTHOR: Azimov, Ya. I.; Anisovich, V. V.; Ansel'm, A. A.; Danilov, G. S.; Dyatlov, I. T.

TITLE: Electromagnetic meson decays in the quark model

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 2, 1965, 50-54

TOPIC TAGS: meson, strange particle, quark model

ABSTRACT: The hypothesis of SU(6) symmetry in strong interactions leads to a large number of relationships between the various matrix elements. In this paper it is pointed out that the use of SU(6) symmetry and the quark model in studying electromagnetic meson decays leads to predictions which may be experimentally verified in the near future. It is suggested that the magnetic moment of a quark may be independent of the type of interaction which binds quarks in particles, as should be the case in the non-relativistic model with weakly bound quarks. "The authors are grateful to V. M. Shekhter for useful consultation." Orig. art. has: 1 table, 2 formulas.

Card 1/2

L 65255-65

ACCESSION NR: AP5014203

3

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe (Physicotechnical Institute)

SUBMITTED: 18Mar65 ENCL: 00 SUB CODE: NP

NO REF SOV: 002 OTHER: 005

Card 2/2

ANISOVICH, V.V.; FOMIN, V.V. [deceased]

Effect of the characteristics of triangular diagrams with decay masses on the mass spectra of the systems $\pi + \Delta_{1238}$, $\pi + \Sigma_{1385}$, and $\pi + \dots$ Iad.fiz. 2 no.3:562-564 S '65. (MIRA 18:9)

1. Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.

AZIMOV, Ya.I.; ANISOVICH, V.V.; ANSEL'M, A.A.; DANILOV, G.S.; DYATLOV, I.T.

On certain mass formulae in a quartet model. IAd. fiz. 2 no.3:583-584 S '65. (MIRA 18:9)

1. Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.

ANISTRATENKO, D.P.; CHERNONOG, L.T.; MASLOVSKAYA, A.D.

Agrometeorological conditions of the formation of a harvest of spring wheat of different times of sowing in the Virgin Territory. Trudy KazNIGMI no.24:133-146 '65.

(MIRA 18:10)

L 8320-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD

ACC NR: AP5025722

SOURCE CODE: UR/0286/65/000/018/0075/0075

INVENTOR: Anitov, I. S.; Nikanorov, M. A.; Khvostyntsev, K. I. 44,55

ORG: none

TITLE: High-strength titanium-base alloy. Class 40, No. 174795 [announced by the Organization of the State Committee of Defense Engineering USSR (Organizatsiya gosudarstvennogo komiteta po oboronnoy tekhnike USSR)] 44,55

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 18, 1965, 75

TOPIC TAGS: titanium alloy, aluminum containing alloy, molybdenum containing alloy, vanadium containing alloy, chromium containing alloy

ABSTRACT: This Author Certificate introduces a high-strength titanium-base alloy containing aluminum, molybdenum, vanadium, and chromium. To improve ductility, the alloy composition is as follows: 2.5—3.5% aluminum, 3.2—4.5% molybdenum, 6.5—7.5% vanadium, 10—11.3% chromium, and the balance titanium. [ND]

SUB CODE: 11/ SUBM DATE: 01Jun64/ ATD PRESS: 4149

OC

Card 1/1

UDC: 669.295.5.018.2

ANISOVICH, V.V.

Prediction of masses in meson multiplets in a simple quartet model. Pis'. v red. Zhur. eksper. i teoret. fiz. 2 no.12: 554-557 D '65. (MIRA 19:1)

1. Institut fiziki vysokikh energiy. Submitted Nov. 3, 1965.

AZIMOV, Ya.I.; ANISOVICH, V.V.; ANSEL'M, A.A.; DANILOV, G.S.; DYATLOV, I.T.

Possible classification of elementary particles in the quartet model. Pis'. v red. Zhur. eksper. i teoret.fiz. 2 no.3:109-113 Ag '65. (MIRA 18:12)

1. Fiziko-tekhnicheskiy institut imeni Ioffe AN SSSR. Submitted June 3, 1965.

ANISOVICH, V.V.; DAKHNO, L.G.

Effect of strong interaction between final-state π-mesons on the probability ratios of $K \rightarrow 3\pi$ decay. IAd. fiz. 2 no.4: 710-715 O '65. (MIRA 18:11)

1. Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.

ANISOVICH, V.V.; ANSEL'M, A.A.

Theory of reactions with three-particle formation near the threshold. Usp. fiz. nauk 88 no.2:287-326 F '66. (MIRA 19:2)

1. Institut fiziki vysokikh energiy i Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.

L 24314-66 EWT(m)/T

ACC NR: AP6007269 SOURCE CODE: UR/0053/66/088/002/0287/0326

30
B

AUTHOR: Anisovich, V. V.; Ansel'm, A. A.

ORG: Institute of High-Energy Physics (Institut fiziki vysokikh energiy); Physico-technical Institute im. A. F. Ioffe, AN SSSR (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: Theory of reactions with formation of three particles near threshold

SOURCE: Uspekhi fizicheskikh nauk, v. 88, no. 2, 1966, 287-326

TOPIC TAGS: elementary particle, quantum electrodynamics, particle interaction, scattering amplitude, pion, nucleon, gamma quantum, K meson

ABSTRACT: This is a review article dealing with the theoretical interpretation of reactions with multiple production of particles, with emphasis on the determination of the scattering amplitudes of unstable particles at zero energy. The approach used is based on an investigation of processes connected with formation of several particles near the threshold, when the total released kinetic energy is lower than the mass of any particle, and makes it possible to develop a consistent theory that describes reactions with creation of low-energy particles in terms of a certain number of independent parameters and in terms of the scattering amplitudes of the pairs of produced particles. The analysis is limited to three-particle production. Kinematic relations are derived for the transformation of two particles into three, and rules for selecting the proper Feynman diagrams are formulated. It is shown that in the case of low-energy nucleon-nucleon scattering the selection rules lead directly to

Card 1/2 UDC: 539.12.01

L 24314-66

ACC NR: AP6007269

the Bethe-Peierls effective-radius theory. The section headings are: Introduction. 1. Kinematics. 2. Fundamental principles of diagram selection. 3. Scattering of particles near threshold. 4. Expansion of the amplitude in terms of states with different total angular momenta. 5. Unitarity condition and calculation of discontinuities. 6. Linear and quadratic terms in the expansion of the amplitude with $L = 0$ in terms of the threshold momenta. 7. Cubic terms in the expansion in terms of the threshold momenta and the general structure of the expansion of the amplitude with $L = 0$. 8. Production of three particles in a state with unity total angular momentum. 9. Resonant interaction of produced particles. 10. The reactions $\pi + N \to N + \pi + \pi$, $\gamma + N \to N + \pi + \pi$, and $K \to 3\pi$ decay. Appendix. Orig. art. has: 27 figures and 99 formulas.

SUB CODE: 20/ ORIG REF: 017/ OTH REF: 009

SUBM DATE: none

Card 2/2

ANISTAROV, V.A. [deceased]

Effect of swamped basins on the maximum runoff of spring high water. Trudy OGMI no.15:175-186 '58. (MIRA 12:7)

1.Belorusskaya NIGO.

(Runoff) (Swamps)

FOMENKO, V.Yu.; SHCHERBAKOVA, K.F.; ANISTRAT, N.D.; MISHUROV, Ye.M.

New data on the interrelations between the rocks of the mikkle and upper series in the Krivoy Rog Basin. Dokl.AN SSSR 108 no.3: 535-537 My '56. (MLRA 9:8)

1. Predstavleno akademikom A.G. Betekhtinym.
(Krivoy Rog--Rocks)

ANISTRAT, N.D.

Further improvement of work conditions at the Chimkent Lead Smelting Plant. TSvet. met. 33 no.6:81-82 Je '60. (MIRA 14:4)
(CHIMKENT--LEAD--METALLURGY)
(METALWORKERS--DISEASES AND HYGIENE)

KOPYT, A.D.; ANISTRATENKO, D.P.

The problem of adequate borehole numbers in soil moisture determination. Trudy KazNIGMI no.13:89-96 '59. (MIRA 13:8)
(Kazakhstan--Soil moisture)

L 52722-65 EPA(s)-2/EWT(m)/EPF(c)/EWG(m)/EPA(w)-2/EWP(j)/T Pc-4/Pab-10/
Pr-4/Pt-7 EWH/WW/RM
ACCESSION NR: AP5014527 UR/0069/65/027/003/0412/0416
541.183.23

AUTHOR: Natanson, E. M.; Chernogorenko, V. B.; Khimchenko, Yu. I.; Anistratenko, G. A.

TITLE: Interaction of macromolecules of natural rubber and isobutylene with colloidal particles of nickel and cobalt as they are formed at the cathode

SOURCE: Kolloidnyy zhurnal, v. 27, no. 3, 1965, 412-416

TOPIC TAGS: metallopolymer, natural rubber, isobutylene, colloidal nickel, colloidal cobalt, semiconductor, organic semiconductor

ABSTRACT: New "metallopolymers"—interaction products of natural rubber and polyisobutylene with colloidal nickel and cobalt in a two-layer electrolytic bath—were prepared, their optimum preparative conditions determined, and their properties studied. The products were black materials, rubber-like at low metal content and powdery at above 60% metal. With regard to electrical conductivity, the products were dielectrics at low metal concentrations, and quasi-metallic conductors at high (above 80%) metal concentrations. Swelling tests showed that rubber adsorbed di-

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L 52722-65
ACCESSION NR: AP5014527

rectly on the surface of colloidal metal particles did not swell, which apparently indicates the high strength of the bond. IR spectra of such rubber, however, did not differ from IR spectra of nonfilled rubber. The experimental results are interpreted in terms of the formation of various types of network structure. Orig. art. has: 1 table and 3 figures. [SM]

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN UkrSSR, Kiev (Institute of General and Inorganic Chemistry, AN UkrSSR)

SUBMITTED: 02Aug63 ENCL: 00 SUB CODE: OC, IC

NO REF SOV: 009 OTHER: 000 ATD PRESS: 4011

Card 2/2

L 53719-65 EPA(s)-2/EWT(m)/EPF(c)/EWG(m)/EPA(w)-2/EWP(j)/T Pc-4/Pab-10/
Pr-4/Pt-7 RWH/WW/RM

ACCESSION NR: AP5014308 UR/0073/65/031/006/0592/0596
678.046.32

AUTHOR: Natanson, E. M.; Chernogorenko, V. B.; Anistratenko, G. A.

TITLE: Properties of metallopolymers based on epoxy resin and colloidal iron

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 31, no. 6, 1965, 592-596

TOPIC TAGS: metallopolymer, colloidal iron, epoxy resin, semiconductor, organic semiconductor

ABSTRACT: New current-conducting "metallopolymers" (products of the interaction of polymers with colloidal metals in a two-layer electrolytic bath) based on epoxy resin and iron have been prepared and their electrical conductivity and thermomechanical properties have been studied. It is noted that metallopolymers can find use as active fillers, and as current- and heat-conducting, ferromagnetic, and semiconductor materials. The new metallopolymers (whose preparative conditions are given in the original article) were prepared either with or without a surface active agent (oleic acid). To prevent

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APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000101630005-5"

L 52719-65

ACCESSION NR: AP5014308

oxidation, which readily occurred, the products were stored in sealed vessels. At 19% Fe, the polymers were black powders. Conductivity was higher with oleic acid than without, e.g., 5×10^{-2} $ohm^{-1}cm^{-1}$ at 79.1% Fe versus 7×10^{-7} $ohm^{-1}cm^{-1}$ at 86.2% Fe. The plot of (log conductivity) versus reciprocal absolute temperature was linear (for the polymer with 86.2% Fe). DTA showed that the presence of colloidal iron raises the temperature of thermal-oxidative degradation of the epoxy resin. DTA also revealed the existence of an optimum degree of filling at which the polymer and filler form a strong network structure. Thermomechanical curves (Fig. 1 of the Enclosure) showed that at above 19% Fe, the polymer loses its viscous-flow properties, apparently owing to the formation of the strong network structure. Orig. art. has: 1 table and 3 figures. [SM]

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN UkrSSR (Institut of General and Inorganic Chemistry, AN UkrSSR)

SUBMITTED: 02Feb64 ENCL: 01 SUB CODE: OC, IC

NO REF SOV: 007 OTHER: 000 ATD PRESS: 4011

Card 2/3

L 52719-65
ACCESSION NR: AP5014308 ENCLOSURE: 01

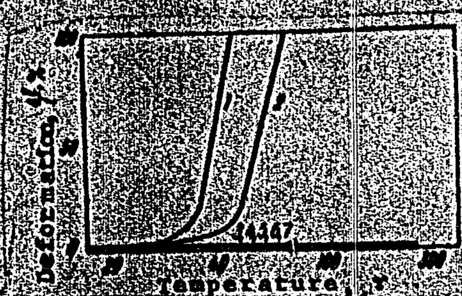

Fig. 1. Thermomechanical curves taken at a heating rate of 1.3 degree C/min and σ = 0.84 kg/cm^2

1 - Epoxy resin; 2, 3, 4 - metallopolymers containing 5.0, 19.0, and 53.2% Fe lyophilized with oleic acid; 5, 6, 7 - metallopolymers containing 38, 46.2, and 86.2% Fe without oleic acid.

Card 3/3

ANISTRATENKO, I.K., dotsent (Kiyev, ul. Leontovicha, d.5, kv.1);
CHUMAKOV, V.K.

Case of the stomach fibromyoma. Klin.khir. no.6:81-82 Je '62.
(MIRA 16:5)

1. Kafedra gospital'noy khirurgii Kiyevskogo meditsinskogo instituta i Kiyevskaya bol'nitsa imeni Oktyabr'skoy revolyutsii.
(STOMACH--TUMORS)

ANISTRATENKO, V.A.; STABNIKOV, V.N.

Hydrodynamics of dry scaly type plates of the mass transfer columns. Izv.vys.ucheb.zav.; pishch. tekh. no.3:143-150 '63. (MIRA 16:8)

1. Kiyevskiy tekhnologicheskiy institut pishchevoy promyshlennosti, kafedra protsessov i apparatov.

(Distillation apparatus) (Mass transfer)

STABNIKOV, V.N.; ANISTRATENKO, V.A.

V.V.Kafarov: Fundamentals of mass transfer. Izv.vys.ucheb.zav.; pishch. tekh. no.3:174-176 '63. (MIRA 16:8)
(Mass transfer)

ANISTRATENKO, V.A.; STABNIKOV, V.N.

Hydraulics and mass transfer characteristics of the spray plates of mass transfer columns. Izv.vys.ucheb.zav.; pishch.tekh. no.1:128-135 '64. (MIRA 17:4)

1. Kiyevskiy tekhnologicheskiy institut pishchevoy promyshlennosti, kafedra protsessov i apparatov.

ANISTRATENKO, V.A.; STABNIKOV, V.N.

Mass transfer characteristics of spray plates. Izv.vys.ucheb.zav.; pishch.tekh. no.1:135-142 '64. (MIRA 17:4)

1. Kiyevskiy tekhnologicheskiy institut pishchevoy promyshlennosti, kafedra protsessov i apparatov.

ANISTRATENKO, V.A. [Anistratenko, V.O.]; STABNIKOV, V.N. [Stabnykov, V.M.]

Hydrodynamic and mass transfer characteristics of the spray plates of fractional and absorption apparatus. Khar. prom. no.2:54-56 Ap-Je '65. (MIRA 18:5)

L 57569-65 EWT(1)/T/EEC(b)-2 Pi-4 IJP(c) GG

ACCESSION NR: AP5016138 UR/0048/65/029/006/0973/0977

34
33
B

AUTHOR: Anistratov, A.T.; Fotchenkov, A.A.; Aleksandrov, K.S.

TITLE: Measurement of the linear electro-optical effect in crystals by a dynamic procedure /Report, 4th All-Union Conference on Ferroelectricity held in Rostov-on-the-Don 12-18 Sept 1964/ 21

SOURCE: AN SSSR. Izvestiya.Ser.fizicheskaya,v.29,no.6,1965, 973-977

TOPIC TAGS: ferroelectric crystal, Rochelle salt, double refraction, phase transition

ABSTRACT: The authors describe a method for measuring the electro-optical constants of a crystal with the aid of an apparatus which they have described elsewhere (Pribory i tekhnika eksperimenta No.3, 193,1965). An alternating electric field is applied to the crystal and the consequent modulation of a light beam traversing the crystal between crossed Nicols is observed. The theory of this method is developed and it is shown that when the Nicols are crossed (90°) the

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L 57569-65
ACCESSION NR: AP5016132

deformation of the optical indicatrix modulates the beam at the applied frequency and the rotation of the indicatrix modulates the beam at twice this frequency. When the Nicols are set at 45° the situation is reversed: rotation of the optical indicatrix modulates the light beam at the applied frequency and deformation modulates it at the second harmonic. With the proposed method, therefore, it is possible accurately and separately to determine the effects of rotation and deformation of the optical indicatrix. The proposed method was employed to investigate the electro-optical effect in Rochelle salt. For this material, of the 18 electro-optical coefficients r_{ij}, only r_{41}, r_{52} and r_{63} do not vanish in the paraelectric state. In the less symmetric ferroelectric state r_{11}, r_{21}, r_{31}, r_{53} and r_{62} also are different from zero. The quantities r_{41} and $c = n_y^3 r_{21} - n_z^3 r_{31}$ were measured at temperatures from 21 to 36°C (n_y and n_z are the corresponding refractive indices). The frequency of the alternating field was 1000 cycle/sec and its amplitude did not exceed 1 kV/cm. The coefficient r_{41} reached its maximum value of 4×10^{-6} cgs units at the Curie point. Application of a constant electric field reduced the value

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L 57569-65

ACCESSION NR: AP5016132

of r_{41}. In the presence of a 2 kV/cm bias field the quantity c was independent of temperature and equal to 1.9×10^{-7} cgs units in the ferroelectric phase. The quantity c did not fall immediately to zero at the Curie point, but was still approximately 5×10^{-9} cgs units at 28°C. This behavior is ascribed to "smearing out" of the phase transition by the bias field. The numerical results must be regarded as preliminary, for they have not been corrected for the temperature dependence of the natural double refraction. Orig. art. has: 9 formulas 2 figures and 2 tables.

ASSOCIATION: Institut fiziki Sibirskogo otdeleniya Akademii nauk SSSR (Physics Institute, Siberian Section of the Academy of Sciences of the SSSR)

SUBMITTED: 00 ENCL: 00 SUB CODE: SS, OP

NR REF SOV: 008 OTHER: 003

Card 3/3

L 26744-66 EWT(1)/EEC(k)-2

ACC NR: AP6011469 SOURCE CODE: UR/0070/66/011/002/0255/0258

45
B

AUTHOR: Anistratov, A. T.; Aleksandrov, K. S.

ORG: Institute of Physics, Siberian Department, AN SSSR (Institut fiziki Sibirskogo otdeleniya AN SSSR)

TITLE: Conditions for separate measurement of the linear and quadratic electro-optical effects

SOURCE: Kristallografiya, v. 11, no. 2, 1966, 255-258

TOPIC TAGS: electrooptic effect, piezoelectric crystal, electric polarization

ABSTRACT: The authors show that even when the linear and quadratic electrooptical effects exist simultaneously in piezoelectric crystals, they can be measured separately by either static or dynamic methods. The proof is based on an evaluation of the change occurring in the polarization constants of such crystals following application of an electric field, expressed in terms of the strain and the rotation of the optical axis. This conclusion is corroborated by a theoretical analysis and it is pointed out in the conclusion that the possibility of separating the two effects has never been employed before. The authors propose to review in a future paper the presently available experimental data from the point of view of their deduction. The authors thank A. A. Fotchenkov for participating in a discussion of the results. Orig. art. has: 13 formulas.

SUB CODE: 20/ SUBM DATE: 04Jan65/ ORIG REF: 010/ OTH REF: 011

Card 1/1 FV UDC: 548.0: 537.228

ACC NR: AP6032962 SOURCE CODE: UR/0070/66/011/005/0823/0825

AUTHOR: Anistratov, A. T.

ORG: Institute of Physics, SO AN SSSR (Institut fiziki SO AN SSSR)

TITLE: Anomalous linear electrooptic effect in Rochelle salt

SOURCE: Kristallografiya, v. 11, no. 5, 1966, 823-825

TOPIC TAGS: electrooptic effect, Curie point, dielectric constant, electric polarization

ABSTRACT: The author investigated the temperature dependence of the linear electrooptic effect in the vicinity of the Curie point by measuring simultandously the dielectric constant of the free crystal and the coefficient of linear electrooptic effect r_{41} under identical conditions. The quantity actually investigated was $\rho_{41} = \partial\Delta a_{23}/\partial P_1$, where Δa_{23} is the increment of the polarization constant and P_1 is the polarization; the reason for investigating this quantity is that it is expected to have no anomaly in the transition region. The measurements were made on X-cut single-crystal Rochelle salt in the temperature interval +18 - 29°C in monochromatic light (546 nm) by a procedure described earlier (Izv AN SSSR ser. fiz. v. 29, no. 6, 973, 1965). The balance indicator was an oscilloscope. The measurements of ρ_{41} and of the dielectric constant were made simultaneously by applying to the sample a constant polarizing field ranging from 265 to 2000 v/cm. The resultant plot of ρ_{41} against the temperature shows that at large electric fields (2000 v/cm), much larger than the co-

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ACC NR: AP6032962

ercive fields, the value of ρ_{41} is independent of the temperature and of the polarizing field. However, when the polarizing fields are comparable with the coercive fields (265 - 700 v/cm), the deviation from constancy increases as a result of measurment errors and losses due to the domain structure. An estimate of $-4.4 \pm 0.2 \times 10^{-8}$ cgs esu is obtained for ρ_{41}. The part of the effect induced by the inverse piezoeffect is estimated at -0.6×10^{-8} cgs esu. The spontaneous rotation of the optical axes of the free crystal is estimated at $2\varphi \approx 3.1°$, in agreement with other work. It is therefore concluded that the electrooptic coefficient of Rochelle salt does not change on going through the upper Curie point and is not connected with dielectric anomalies. The author thanks K. S. Aleksandrov and A. A. Fotchenkov for valuable advice and a discussion. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 19Jul65/ ORIG REF: 006/ OTH REF: 008

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